

Forum Compact

Ear, Nose and Throat Medicine

A new solution provides more transparency

Getting to the roots of hearing

When we're talking about hearing aids, ENT doctors' opinions are very important. The not only provide the medical indication for the maintenance of hearing aids, they also test the quality and success of the solution afterwards. Unfortunately, with modern, digital hearing aids, quality control is possible only to a limited degree with traditional methods. This situation is alleviated through a technique called AURICAL Visible Speech, which offers ENT practices and clinics a variety of advantages. PD Dr. Jürgen Alberty, senior physician at the clinic and polyclinic for ENT Medicine at the University Clinic in Münster, talks about his experiences with this new technique.

Interview

Dr. Alberty, what role does an institution like the ENT Clinic of the University Clinic at the University of Münster play in the maintenance of hearing aids? What tasks do you have in their provision?

PD Dr. Alberty: The provision process is usually the following: The patient visits the ENT physician or the clinic because he has hearing difficulties. When clinical and audiometrical tests agree, the need for a hearing aid is confirmed. In practice, a standard form is filled out, which the patient then takes to the acoustical specialist of choice and has the hearing aid adjusted.

In this process, a comparative adjustment of three different hearing aids is prescribed. These hearing aids must be procured according to a certain system, so that the regular monthly tariffs of the public health care system fully cover all costs. Patient and acoustical specialist together choose the hearing aid that fits the best.

After a test run to optimize the hearing aid settings, the patient visits the ENT physician once more. This physician has to confirm that the recommended hearing aid actually provides the envisaged improvement and that the chosen hearing aid is the best, through a series of audiometric tests. This final test of the hearing aid by an ENT physician is obligatory. The acoustical specialist can only calculate the fixed or supplementary costs for the billed party after these tests have taken place.

In the ENT University Clinic here at the University of Münster, we prescribe hearing aids and test them afterwards. In addition, we are often needed, when in spite of all the efforts of an acoustical specialist, a successful treatment is not possible. In these cases, we analyse what can still be done.

In order to test the performance of hearing aids, you have been using AURICAL Visible Speech for the past year and a half? How did you measure performance before you had this method?

PD Dr. Alberty: There were different development phases. In the analog age, we adjusted hearing aids ourselves. At that time, we had an analog measurement box that measured the signal augmentation performance of hearing aids under standardized conditions. The input signals were usually sinus tones. For that reason, we still knew the technical capabilities of hearing aids very well.

With the introduction of digital technology in hearing aid production, this transparency was lost. The mechanisms, with which speech and other signals were filtered and processed, became the coveted trade secrets of manufacturers. As a result, we could only test if one could hear better or worse, through clinical open-air audiometry. We could hardly test the technical qualities of hearing aids anymore, because the traditional in-situ measurement techniques with tones couldn't take the complex filter and rule-based qualities of modern hearing aids into account, needed to estimate the real volume augmentation levels in real life. Thanks to Visible Speech, we can make useful assessments with in-situ measurement via speech imitation.

Was it this lack of transparency that led you to use Visible Speech at the University Clinic?

PD Dr. Alberty: Yes, that was it. In the end, it was no longer comprehensible, why a particular hearing aid delivered worse results than expected. From ENT physicians and above all in our capacity as medical advisors, we received more and more inquiries as to why a particular hearing aid did not work. In other cases, we were asked to find out if a more economical solution was possible. To answer these queries, we were forced to refer to the open-air audiometry and hearing-range tests, although these tests were hardly qualified to answer these sorts of questions.

Where do you see the advantages to this solution?

PD Dr. Alberty: With Visible Speech, we can test the output levels of digital hearing aids, meaning in the auditory canal itself, in-situ. With the introduction of digital technology we couldn't do that anymore. We have achieved more clarity as to the acoustical qualities of hearing aids and can show qualified input-output ratios.

This means that we are no longer strictly reliant on the subjective observations of patients. Visible Speech shows us basically what arrives at the eardrum. We can tell exactly if the signal augmentation of the tested system is that which we are aiming for. We can also get to the root of problems that patients have in certain real-life situations.

Just one example: A hearing aid wearer told us that he took out his hearing aid before entering the train station to go to work each morning, because whenever his train pulled into the station, the screeching of the brakes was insufferable. We tested the hearing aid in-situ via Visible Speech and found the root of the problem immediately. When the output level exceeded 80db, around the level of the breaking noise, the digital hearing aid clearly augmented the output signal over the comfort level. The hearing aid acoustical specialist optimized the settings and since then, the patient has had no further problems.

In order to avoid misunderstandings: Visible Speech does not replace open-air audiometry. We can not go without this technique, because we need to know how patients fare with varied auditory situations. However, Visible Speech allows us to test very important technical qualities of respective hearing aids. We feel much more confident in our conclusions as to a particular hearing aid solution, because we now know exactly what a particular hearing aid can provide.

Are there other advantages in addition to that? Does this solution have a positive effect on patient treatment on a daily basis?

PD. Dr. Alberty: In any case. A complete audiometric hearing aid test with open-air audiometry and hearing range test can take over an hour. The patient must really pay attention, especially when his speech comprehension with extraneous noise is tested. Naturally, this situation is straining, especially because a lot of our patients are senior citizens and/or children.

Thanks to Visible Speech, we only have to do an additional open-air speech audiometry for three to five minutes. The patient sits relaxed in a chair during this in-situ test and hears just a speech-similar sound. Now everything is much simpler: for the patients and for the colleagues as well. In addition, we can assume that the short examination times hardly cost anything.

In addition, we can use Visible Speech for discussions with our patients. It is understandable, that a patient usually doesn't understand the documentation for speech audiometry test. With the visualization function of the in-situ measurements, we can now show patients, why or why not the hearing aid solution performs according to our wishes. Pictures just say more than numbers and tables. They can also be very helpful in encouraging a patient not to give up and have his hearing aid further adjusted. (Example 1a and b)

You mentioned already that one of your tasks is to provide medical opinions, when there is doubt as to the quality of a hearing aid solution?

PD Dr. Alberty: These kinds of assessments have become more and more commonplace. As a rule, sponsors want to know if the patient or the insured customer actually profit from a particular solution, especially as the costs are often thousands of Euros more than the allotted fixed costs. When there is doubt as to whether a particular solution is adequate, we are often charged by insurance companies or courts to examine the situation.

Another example: A patient has a hearing problem with extraneous noise and he receives a hearing aid through his accident insurance. At the same time, the costs for this equipment are much higher than the normally covered amount. The workers' compensation board will want to know, whether this hearing aid is actually necessary or if maybe there is a cheaper alternative.

What parameters were required in the past for the assessment of hearing aid solutions?

PD Dr. Alberty: Officially, the respective ENT physician must confirm, through his own measurements, that the solution recommended by the acoustical specialist, provides the prescribed improvement in single-syllable comprehension, in an open-air audiometry test.

There are additional criteria for dual-ear solutions. In this case, the dual-ear solution must show either improved directional hearing or with extraneous noise, in comparison with a single-ear solution.

How sure can you be that you get an accurate assessment?

PD Dr. Alberty: Optimal conditions are possible when we can compare the output of different devices, with their particular settings, respectively. As long as the decision to use a particular hearing aid is decided by the patient and the acoustical specialist, there will always be a grey area that we cannot analyse clearly, because we usually cannot compare different devices. The acoustical specialist is only required to document his speech audiometric data. The settings for a particular device cannot be extrapolated from this data.

Before Visible Speech, we couldn't test the real output levels, even by newly adjusted devices. We could just test, on the basis of speech audiometric data, whether or not the solution was technically „successful“.

Now we have another possibility in addition to this, i.e. a comparison of similarly adjusted optimizations, for a formal assessment. We can ask that the patient receive optimized devices with

pre-determined settings. In this situation, thanks to this new solution, we can ascertain whether or not the augmentation qualities of particular devices were correctly adjusted. Without Visible Speech, this was practically impossible for us.

In an attempt to avoid giving the wrong impression: As your example with the screeching brakes showed, you use Visible Speech not only to check the acoustical specialist's data for the respective sponsor, but also in order to insure the best possible solution, together with the acoustical specialist, for the patient?

PD Dr. Alberty: Of course we can also see, thanks to Visible Speech, when the acoustical specialist has done fine work. However, there are always problems when the adjustments were not successful or very expensive, respectively. In these cases, it's usually a very complicated situation, for example by patients with extreme hearing problems or with children. Now we can analyse where the technical problem could lie.

Our patients also receive the results of our tests. We can inform the acoustical specialist through this process, which settings we recommend for the device. This sort of cooperation can be productive.

Let's get back to Visible Speech. Where there any other solutions that were also considered?

PD Dr. Alberty: As far as we know, there are no similar systems on the market.

And the implementation of this system? How much work was required to start work with AURICAL Visible Speech

PD Dr. Albert: The effort was minimal. With a new installation, the system is ready in a matter of hours. The measurement process is easily learned.

We only had difficulties with the integration with our network. We procured Visible Speech purely in a workstation version, in order to evaluate how effective a solution it would be. Because of this type of installation, we had trouble with the integration in our internal network, although this had nothing to do with the product itself. With a multiple workstation license, we would have avoided a lot of stress.

Could you recommend the use of Visible Speech to your colleagues, after having had some experience with it?

PD Dr. Alberty: I think that all ENT physicians and "Pedaudiologists" that see themselves as particularly qualified for the treatment of hearing-impaired patients and the optimization of hearing aids, should use this programme. In the future, one should not go something like this. In order to give qualified hearing aid solutions, in-situ measurements are absolutely necessary.

Dr. Alberty, thank you very much for this lengthy discussion and good luck with your further work.

Better hearing made visible

Fig. 1a and 1b: Measurement with AURICAL Visible Speech on patient at the clinic and polyclinic for ENT Medicine at the University Clinic in Münster (Photo: ZS&P)

Fig 2: PD Dr. Jürgen Alberty, senior physician at the clinic and polyclinic for ENT Medicine at the University Clinic in Münster (Photo: ZS&P)